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ABSTRACT

The family reunification provision in U.S. immigration laws allows foreign-born children of immigrants to enter the United States and attend American schools. The total number of school years completed by immigrant children, however, is affected by their age at arrival. Age at arrival also affects the percentage of schooling that is attained in the United States. This implies that immigrants with more U.S. schooling will earn more than other immigrants, holding total education constant, as long as the returns to U.S. schooling are greater than the returns to foreign schooling. Analysis of 1980 and 1990 census data revealed a negative relationship between age at arrival and educational attainment for Mexicans, Europeans, and Pacific Islanders that arrived after the start of the first grade. Mexican immigrants as a whole, however, lost the greatest amount of education from delayed entry. Estimates of the returns to U.S. schooling indicate that those with at least a high school diploma benefited from additional years in U.S. schools. However, the added tax revenue from the increased earnings was not always greater than the cost to taxpayers of additional years of U.S. schooling. Only for Mexican immigrants did the tax revenues outweigh the fiscal costs of more U.S. education. (Contains 22 references and 7 data tables.) (Author/SV)

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Arturo González

Number 26
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WORKING PAPER SERIES

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Abstract

The family reunification provision in U.S. immigration laws allows foreign-born children of immigrants to enter the U.S. and attend American schools. The total number of school years completed by immigrant children, however, is affected by their age at arrival. Age at arrival also affects the percentage of schooling that is attained in the U.S. This implies that immigrants with more U.S. schooling will earn more than other immigrants, holding total education constant, as long as the returns to U.S. schooling are greater than the returns to foreign schooling. Using data from the 1980 and 1990 Census, I find a negative relationship between age at arrival and education for Mexican, European and Pacific Islander and other immigrants that arrive shortly after the start of the first grade. Mexican immigrants as a whole, however, lose the greatest amount of education from delayed entry. Estimates of the returns to American schooling indicate that those with at least a high school diploma benefit from additional years in U.S. schools. However, the added tax revenue from the increased earnings is not always greater than the cost of additional years of American schooling. Only for Mexican immigrants is it the case that the tax revenues outweigh the fiscal costs of more American education.

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The family reunification provision in American immigration law allows foreign-born children of immigrants to enter the country and attend American schools. This paper adds to the existing literature on immigrant education (Gandara, 1995, Kao and Tienda, 1995, Vernez and Abrahamse, 1996) by first detailing how age at arrival affects the total educational achievement of immigrant children. Age at arrival not only affects the total amount of education attained by immigrants, but it also affects the *percentage* of American education that is attained. As foreign schooling is not fully transferable to U.S. labor markets, immigrants with more year of U.S.-specific education will earn more than other immigrants with less U.S. schooling if the returns to domestic education is greater than the returns to foreign schooling (holding total education constant). For this reason, I also estimate the returns to foreign and domestic schooling and examine whether exchanging American schooling for foreign schooling increases immigrant earnings. On the basis of this analysis and estimate, I posit that if the increased immigrant tax revenue covers the full cost of the additional education, policy makers may benefit American taxpayers by establishing policies which encourage families to immigrate when their children are relatively young.

Although Borjas (1995), Friedberg (1993), and Schoeni, McCarthy and Vernez (1996) address the effect of age at arrival on the labor-market assimilation of immigrants, the economic literature lacks a thorough analysis of the impact of age at arrival on the educational attainment of immigrant children in the U.S.[1] Since most recent immigrants come from developing countries in Asia and Latin America, children that enter the U.S. at a young age will have a relative advantage in the classroom over immigrants who arrive at an older age. Immigrants that arrive at younger ages acquire more total years of education than older-at-arrival immigrants because it is costlier for older children to adjust to the new curriculum, language, and culture of the U.S. Similarly, younger children do not experience the same disruptions in the education process, such as repeating a grade level, to the same extent as older immigrants. Lastly, success in American schools depends on the transferability of the country-of-origin education, and the less comparable that education is to American schooling, the greater difficulty older immigrants will face.

Age at arrival not only affects the total amount of education, but it also affects the number of years of U.S.-specific education that an immigrant attains. The labor market consequences of having more years of U.S. schooling are an important consideration for both immigrants and U.S. taxpayers if country-specific education affects immigrant earnings. Bratsberg and Terrell (1994), for example, find that the returns to education differ across countries and that immigrants from countries with higher-quality education systems earn more than other immigrants. Schoeni (1996) separates immigrants with all foreign and all U.S. schooling and finds a higher rate of return for domestic schooling. Similarly, Friedberg's (1996) analysis of immigrants of all ages in Israel shows that Israeli education is more valued than foreign education, especially among those with more years of education.[2] This study extends the previous literature by considering the case of U.S. immigrants who arrived as children, and by comparing the social and private gains of providing additional domestic education to immigrants.

Analyzing child immigrants from the 1980 and 1990 U.S. Census (5% U.S. public use files), I find that immigrants from Mexico, Europe, and the Pacific Islands and "other" countries attain less education the older they are at arrival, although Mexican immigrants are at greatest risk. The results of this study reveal that the returns to U.S. schooling are greater than foreign schooling for immigrants with at least a high school diploma. However, natives benefit if cer-

* I would like to thank Ed Funkhouser, Steve Trejo and Jon Sonstelie for valuable comments, as well as Kevin McKinney and Brian Duncan. Steve Trejo provided the data.

[1] Allensworth (1997), Carliner (1996) and Schoeni (1996) briefly examine the relationship between age at arrival and education. Jones (1987) studies the effect of age at arrival on educational attainment of immigrants in Canada, although he does not consider cohort effects.

[2] Reimers (1984) finds no statistical difference between foreign and domestic education, while Carliner (1996) finds that the return to domestic schooling is only 7% greater than foreign schooling.

tain immigrants attain more years of U.S. education only if the tax rate of the additional income is around 40 percent. While some immigrant groups do not always earn enough to pay for the additional schooling, Mexican immigrants contribute enough taxes to nearly offset the cost of for their U.S. education.

The Education of Immigrant Children

1980 and 1990 Census Data

The data for this study comes from the 1990 and 1980 5% U.S. PUMS files. The sample consists of immigrant and a 10 percent random draw of native men 25 years and older, not enrolled in school, employed in the private sector (who worked at least some time during the year previous to the census) and with wages between $1-$200 (in 1980 dollars).[3] To reduce any bias introduced by immigrants admitted under student visas, I limit the sample to those that arrived before the age of 19.[4] These sampling rules imply that only those with at least six years of U.S. experience are included. In other words, those that entered before 1985 (in the 1990 data) or before 1975 (in the 1980 data) are not included in the sample.[5] Furthermore, persons living in group quarters, with allocated data for year of migration, income, or years of schooling are also excluded from the analysis. In total, the sample consists of 57,277 immigrants and 585,907 U.S.-born natives.

Education Attainment as of 1980 and 1990

Table 1 presents the mean of completed years of education of immigrants disaggregated by ancestry and age at arrival, where age at arrival is defined as the difference between age and the midpoint of the years-since-migration bracket. The first two rows of Table 1 show that immigrants who arrive at early ages attain more education than immigrants arriving at older ages. For example, immigrants who arrived before the age of six average slightly more than 13 years of schooling, while those that arrived in their late-teenage years (ages 15 to 18) average approximately 10 years of schooling.[6] The gap between the youngest and oldest age at arrival cohorts is about 2.5 years in 1980 and 3.3 years in 1990. In general the greatest adverse effect of age at arrival occurs after the age 11. Each succeeding entry-age group loses about one year of education, whereas previous groups lose less than half of a year of education as a result of delayed entry.

Separating immigrants by ancestry reveals important differences. In particular, Mexican immigrants exhibit the most pronounced effect of age at arrival. Although none of the age at arrival cohorts average a high school diploma, delayed entry puts Mexicans at a further disadvantage. For example, compared to the earliest age-at-arrival cohort (aged one to five years), those arriving as nine to11 year-olds average about 1.5 fewer years less education. Those that arrive between the ages of 12 and 14 average only eight years of education, or a deficit of more than three years as compared to the youngest cohort.

The low levels of education for the 12-14 and 15-18 entry-age cohorts of Mexican immigrants resembles the education profile of the general Mexican immigrant population, which averages fewer than eight years of schooling (Borjas, 1996). The large drop-off in completed years of schooling, however, might be explained by the failure of many of these Mexican immigrants to enroll in American schools in the first place. Since Mexican immigrants in the labor force average less than eight years of schooling, immigrants arriving after the age of 15 will have been out of school for over two years. Vernez and Abrahamse (1996) provide evidence that Mexican immigrants over the age

[3] Income is top-coded at $75,000 (in 1980 dollars).

[4] Measurement error in age at arrival for the oldest arrivals (15-18) biases the results downward for these immigrants since some may be admitted under student visas.

[5] The sample selection allowed immigrants as old as 64. However, the oldest immigrant in the current sample is 53 years of age.

[6] To calculate the average years of schooling from the 1990 and 1980 Census, immigrants not completing the first grade are assigned 0 years; first to fourth grade = 2.5 years; fifth to eight grades = 6.5; ninth grade = 9; tenth grade = 10; eleventh or twelfth grade without a diploma = 11; high school diploma = 12; some college, no degree = 13; associate or technical degree = 14; BA degree = 16; MA degree = 17; professional or Ph.D. degree = 20.

Table 1

Average Immigrant School Years in 1980 and 1990, by Age at Arrival[a]

Ethnicity	All Ages	Age at Arrival 1-5	6-8	9-11	12-14	15-18
All						
1980	11.75	13.13	13.24	12.71	11.57	10.66
	(0.03)	(0.05)	(0.06)	(0.08)	(0.07)	(0.05)
1990	11.27	13.26	12.90	12.45	11.06	9.93
	(0.02)	(0.03)	(0.05)	(0.05)	(0.05)	(0.04)
Mexican						
1980	8.53	11.61	11.19	10.01	8.40	7.48
	(0.06)	(0.16)	(0.19)	(0.19)	(0.13)	(0.07)
1990	8.09	11.48	10.61	9.95	8.07	7.06
	(0.04)	(0.09)	(0.12)	(0.12)	(0.08)	(0.04)
Latin						
1980	12.41	13.02	13.18	13.38	12.72	11.91
	(0.07)	(0.21)	(0.25)	(0.19)	(0.13)	(0.10)
1990	12.10	13.33	13.05	12.83	12.39	11.09
	(0.04)	(0.08)	(0.09)	(0.10)	(0.09)	(0.08)
European						
1980	12.68	13.44	13.63	13.39	12.41	11.62
	(0.03)	(0.06)	(0.07)	(0.08)	(0.08)	(0.07)
1990	13.04	13.68	13.60	13.35	12.60	12.08
	(0.03)	(0.04)	(0.06)	(2.79)	(0.07)	(0.07)
Asian						
1980	14.34	14.38	14.16	14.16	14.27	14.40
	(0.09)	(0.21)	(0.29)	(0.28)	(0.21)	(0.13)
1990	14.02	14.70	14.52	14.59	13.94	13.70
	(0.05)	(0.11)	(0.14)	(0.13)	(0.09)	(0.07)
African, Middle Eastern						
1980	13.64	12.88	14.18	13.85	13.31	13.82
	(0.16)	(0.31)	(0.47)	(0.80)	(0.45)	(0.23)
1990	14.54	14.31	14.14	13.86	14.36	14.75
	(0.07)	(0.21)	(0.23)	(0.27)	(0.16)	(0.09)
Pacific Island, Other						
1980	12.07	12.70	13.27	12.60	11.80	11.00
	(0.12)	(0.18)	(0.28)	(0.32)	(0.31)	(0.23)
1990	11.88	12.91	12.72	12.31	11.60	10.83
	(0.08)	(0.11)	(0.19)	(0.24)	(0.21)	(0.17)

[a] *Source:* 1980 and 1990 5% U.S. PUMS files. Standard error in parenthesis.

of 15 are less likely to enroll in school than other immigrants and that those who do enroll face the arduous task of catching up in classes that "are continuously moving faster than they can" (McConnell and Hill, 1993, cited in Vernez and Abrahamse, 1996, pg. 22). Therefore, it is not surprising that Mexican immigrants in this cohort average only eight years of education.

Of the other ancestry groups in Table 1, Latin Americans (excluding Mexicans), Europeans, and "other" immigrants also exhibit falling education levels with higher entry age. For Latin Americans, the youngest entry-age cohort averages about 13 years of education in both 1980 and 1990, but those that enter after the age of 10 average about 11 years of education in 1990 and 12 years of education in 1980. Pacific Islanders and other immigrants suffer more adverse effects in both census years. The average immigrant arriving after the age of 11 does not attain a high school diploma. By the 15 to 18 year age range, these immigrants average about two years less education than those who arrive at a younger age. Although immigrants of European ancestry average high levels of education, they too achieve lower levels of education if they enter the U.S. at older ages. For example, in 1980 the 15-18 entry-age cohort on average do not finish high school, while those that entered as one to five year olds average about 13.4 years of schooling. In 1990, the deficit between these two groups is similar, although their total educational achievement is higher.

The immigrants with the highest average level of education are those from Asia and Africa and the Middle East. Averaging over 14 years of education, these immigrants do not exhibit any particular relationship between schooling and age at arrival. Although Carliner (1996) uses a different sample of immigrants from the 1990 Census, he also finds a small decrease in average education level among Asian and Middle Eastern immigrants. Below I show that this positive relationship is possibly due to an error in measuring the age at arrival for the older entry-age groups.

Regression Analysis: Education Achievement

While Section II showed many of the key conclusions regarding age at arrival's effect on educational attainment, it is instructive to carry out a formal regression analysis of this relationship. The regressions below quantify the relationship between age at arrival and education by also controlling for the effects of ancestry, year of arrival, and the secular increase in education with each decade. The empirical specification is

$$ED_i = aAA_i + C_i\delta + YUS_i\psi + Born_i\beta + \varepsilon_i, \qquad (1)$$

where ED_j is the number of completed school years for person j (immigrants and natives), AA_i is the age at arrival of immigrant i, C_i and YUS_i are vectors of dummy variables indicating year of arrival and years in the U.S., respectively, and $Born_j$ is a vector dummy variable for decade of birth. Since the identity $AA = C - Born$ holds for immigrants but not for natives, a natural way to identify the parameters in (1) is by pooling natives and immigrants from the 1980 and 1990 Census and restricting the parameter of decade of birth to be the same for natives and immigrants.[7] The regressions below generalize (1) by including fourth-order polynomials in age at arrival.

The variables *AA*, *C* and *YUS* are equal to zero for natives, so the coefficients a and y describe the educational achievements of immigrants relative to natives.[8] Specifically, ψ describes the rate at which immigrants overtake or lose ground to natives with time in the U.S. (the assimilation effect). As immigrants must learn English and acclimate to the American education system, it is likely that their education continues into their adult years (Chiswick and Miller, 1994). The year-of-arrival effects given by δ provide insight into the effect of the Immigration and Nationality Act

[7] Since *Born* = *Census Year* – *Age*, restricting the effect of *Born* to be the same for natives and immigrants is equivalent to restricting *Age* and *Census Year* to be the same for both groups.

[8] As *C* + *YUS* = 1, one dummy variable in *C* must be omitted. The coefficients d give the education of the various year-of-arrival cohorts relative to those that arrived after 1980.

Amendments of 1965 on the education attained by past and current immigrant cohorts.

Equation (1) is estimated separately for all immigrants and for each ancestry group: Mexican, Latin American, European, Asian, African and Middle Eastern, and Pacific Island and other. Therefore, controls for region of origin, which proxies for both ethnicity and race, are included only in the grouped regression. The omitted groups are immigrants that arrived between 1980 and 1984, and persons born in the 1910s.

The first column of Table 2 shows the estimated coefficients of the regression that includes all immigrant groups, while the subsequent columns report the results for different ancestry groups.[9] As this paper focuses on age at arrival and age at arrival is included as a quartic, an auxiliary tool to Table 2 is Figure 1, which traces the effect of age at arrival on the education, independent of all other effects. As shown in the top panel, there is a positive relationship between age at arrival and education for entry-ages less than six and a negative relationship after entry-ages greater than six. Although immigrants that arrive after this age start losing education with each year of delayed entry, immigrants that arrive before the age of 10 still attain more total years of education than natives. By the age at arrival of 15, however, immigrants attain about 1.5 less years of schooling than natives.[10]

The effect of age at arrival on Europeans and Pacific Islanders and others is very similar to each other. As shown in the top graph of Figure 1, both groups experience increasing levels of achievement at very young arrival ages. The peak achievement is reached at the age of six for both groups, and falls steadily after that age. By the arrival ages of 10 and 11, both immigrant groups achieve the same amount of education as their native counterparts. After these arrival ages, however, Europeans reach a maximum deficit of about one year by the entry-age of 16, while those of Pacific Island and other descent attain about 0.7 less years of education than similar natives.

The middle panel in Figure 1 indicates that Mexican immigrants arriving before the age of seven perform the same as Mexican-Americans. However, after the age of six, Mexican immigrants quickly lose ground to both natives and young entry-age Mexican immigrants. By the entry-age of 10 immigrants are nearly one year behind natives, and by the age at arrival of 15, immigrants have over three years less education than natives, but this deficit is not greatly exacerbated with further delayed entry. In contrast, Allensworth (1997) examines a cross-section of Mexican immigrants and enters age at arrival as a linear term and finds that immigrants who enter at age 10 and 15 average 1.6 and 2.4 less years of education than natives.

The bottom panel reveals that Latin American, Asian, and African and Middle Eastern immigrants generally outperform natives. The educational outcomes of Latin American and Asian immigrants who enter before the age of 10 are almost identical, and acquire about one more year of education than natives. However, the education of Latin American immigrants continues to fall after the age of 14, while the education profile of Asian immigrants rises after the entry-age of 11.

In sharp contrast to all other groups, African and Middle Eastern immigrants exhibit a mostly *positive* relationship between age at arrival and education. This relationship is clearly seen in the bottom graph of Figure 1. The graph for this groups shows education increasing among young entry-age immigrants, a relatively flat relationship among those who arrive between the ages of 5 and 10, and then a strong positive effect for those arriving after this age.

One possible explanation for the positive profile in the Asian and African/Middle Eastern graph is the possible inclusion of immigrants admitted under student visas. Because my measure of age at arrival uses the mid-point of the year-of-arrival bracket, it is possible that persons coded with an age at arrival less than or equal to 18 are actually much older at the time of entry. If these immigrants come to the U.S. to attend college, then such immigrants would be expected to

[9] The specification that pools all immigrant groups also includes place of origin controls.

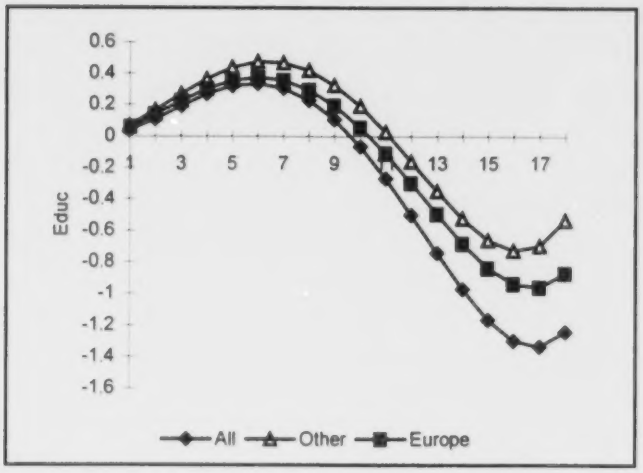
[10] Pooling natives and immigrants requires that age at arrival be set to zero for natives.

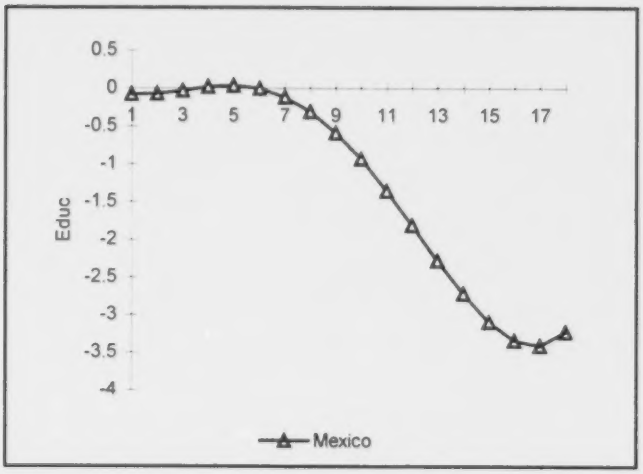
Table 2
Regression Results: Effect of Age at Arrival on Education[a]

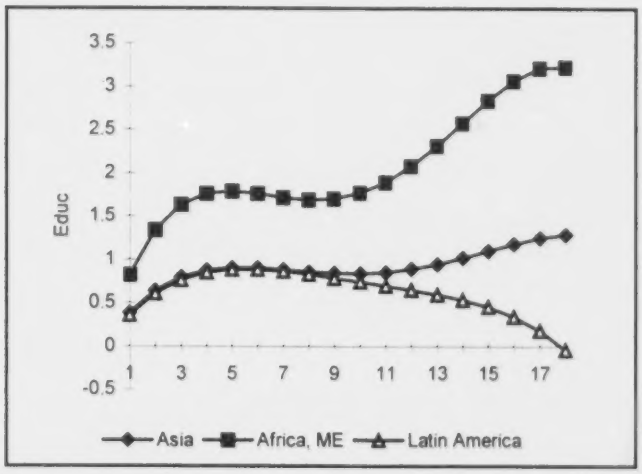
	All		Mexico		Latin America		Africa, M.E.		Asia		Europe		Pac. Isl., Other	
	Est.	(S.E.)	Est.	(S.E.)	Est.	(S.E.)	Est.	(S.E.)	Est.	(S.E.)	Est.	(S.E.)	Est.	(S.E.)
Age at Arrival	**0.008**	**(.066)**	**-0.148**	**(.184)**	**0.419**	**(.212)**	**0.994**	**(.420)**	**0.451**	**(.250)**	**0.038**	**(.092)**	**0.043**	**(.259)**
(Age at Arrival)^2	**0.032**	**(.013)**	**0.072**	**(.036)**	**-0.068**	**(.042)**	**-0.191**	**(.081)**	**-0.078**	**(.049)**	**0.023**	**(.019)**	**0.028**	**(.055)**
(Age at Arrival)^3	**-0.050**	**(.010)**	**-0.099**	**(.026)**	**0.045**	**(.031)**	**0.144**	**(.060)**	**0.053**	**(.037)**	**-0.040**	**(.015)**	**-0.046**	**(.043)**
(Age at Arrival)^4	**0.167**	**(.026)**	**0.322**	**(.065)**	**-0.110**	**(.078)**	**-0.352**	**(.147)**	**-0.118**	**(.092)**	**0.136**	**(.040)**	**0.158**	**(.111)**
Arrived 1975-79	0.331	(.124)	0.048	(.266)	0.939	(.330)	0.141	(.641)	0.368	(.401)	0.152	(.309)	0.108	(.618)
Arrived 1970-74	0.023	(.080)	0.211	(.158)	1.274	(.233)	-0.591	(.381)	1.121	(.260)	-1.163	(.245)	-0.255	(.417)
Arrived 1965-69	0.270	(.111)	0.845	(.253)	1.706	(.309)	-0.746	(.580)	1.290	(.384)	-1.345	(.279)	0.210	(.549)
Arrived 1960-64	0.927	(.099)	1.394	(.221)	2.751	(.299)	-0.491	(.501)	1.560	(.352)	-0.716	(.266)	0.432	(.508)
Arrived 1950-59	0.757	(.110)	2.101	(.268)	2.270	(.363)	-0.956	(.594)	1.579	(.416)	-0.880	(.275)	0.813	(.542)
6-10 Yrs. U.S.	-1.113	(.109)	-1.167	(.322)	-2.624	(.410)	-1.624	(.685)	-2.901	(.458)	-0.686	(.230)	-1.086	(.425)
11-15 Yrs. U.S.	-1.037	(.150)	-1.610	(.390)	-2.452	(.483)	-0.728	(.875)	-2.203	(.566)	-0.266	(.313)	-0.721	(.679)
16-20 Yrs. U.S.	-0.741	(.129)	-1.646	(.344)	-2.108	(.451)	0.132	(.759)	-2.047	(.505)	0.551	(.286)	-0.615	(.568)
21-30 Yrs. U.S.	-0.551	(.139)	-1.818	(.369)	-2.004	(.461)	0.775	(.819)	-1.807	(.537)	0.826	(.297)	-0.152	(.614)
31+ Yrs. U.S.	-0.333	(.143)	-2.020	(.386)	-1.920	(.499)	1.819	(.866)	-1.639	(.566)	1.111	(.300)	-0.090	(.630)
Born 1920s	0.601	(.026)	0.645	(.370)	0.688	(1.057)	1.130	(.108)	0.514	(.438)	0.611	(.029)	0.448	(.066)
Born 1930s	1.379	(.025)	2.666	(.359)	1.558	(1.011)	2.596	(.104)	1.757	(.426)	1.320	(.028)	1.202	(.064)
Born 1940s	2.181	(.025)	4.023	(.356)	2.347	(1.003)	3.937	(.102)	2.342	(.417)	2.050	(.027)	2.076	(.063)
Born1950s	2.361	(.025)	4.740	(.354)	2.640	(.999)	4.437	(.102)	2.390	(.413)	2.143	(.027)	2.420	(.062)
Born 1960s	2.224	(.026)	5.035	(.358)	2.734	(1.001)	4.521	(.106)	2.621	(.421)	1.899	(.029)	2.313	(.065)
Constant	11.136	(.024)	6.885	(.351)	9.650	(.996)	7.861	(.099)	11.706	(.406)	11.283	(.026)	9.816	(.060)
adj-R^2	0.145		0.225		0.095		0.181		0.051		0.047		0.058	
N	643,184		30,063		10,657		43,629		8,162		441,185		109,488	

[a] *Note:* Dependent variable: Completed school years. See text for sample selection. The parameter estimates of (Age at Arrival)^3 and (Age at Arrival)^4 are multiplied by 10 and 1000, respectively. The *All* column also includes place of origin variables.

Figure 1
Effect of Age at Arrival on Education







have higher than average education levels. As long as the total number of African and Middle Eastern immigrants is small enough, immigrants with student visas will bias the effect of age at arrival upwards. In all, 61 percent Africans and Middle Eastern immigrants arrived at or after the age of 15, but this figure is only 43 percent for the general immigrant population. Furthermore, a regression that restricts the sample to those with age at arrival of 10 or less leads to a profile resembling that of Latin American immigrants.[11] Therefore, the strong positive relationship among African and Middle Eastern immigrants is most likely driven by the fact that many are admitted to the country to pursue a college education.

The regressions in Table 2 reveal other aspects affecting the education of immigrants. With the 1980-84 arrival cohort as the omitted group, the various year of arrival variables indicate that more recent immigrants complete less school years than previous cohorts of immigrants. Of particular interest is the effect of the changes in the immigration laws which altered the requirements for legal immigration to the U.S. The first column of Table 2 shows that overall, immigrants that entered before 1964 have over 0.7 years more education than the most recent arrivals. This differential is about 1.5 years for Asian and Mexican immigrants, around 2.5 for Latin American immigrants, and 0.6 years for Pacific Island and other immigrants. Only among Europeans do pre-1965 immigrants have statistically significant less education than the most recent immigrants.

The coefficients of years in the U.S. express the educational difference between natives and immigrants. The first column shows that time in the U.S. reduces the initial immigrant disadvantage.[12] Thus, even though natives and immigrants continue accumulating schooling throughout their lives, immigrants accumulate education at a much faster pace, but are unable to overcome the initial disadvantage. However, the exception to this conclusion are Mexican immigrants. The education gap between natives and immigrants *increases* with time in the U.S. For example, while immigrants with six to 10 years in the U.S. average 1.2 less years education than natives, those with over 30 years U.S. experience have a deficit of over two school years. In other words 20 to 24 years of U.S. experience implies a reduction of 0.8 years of education. Allensworth (1997) also examined Mexican men with the 1990 Census and found that 20 years in the U.S. decreases immigrant education by 0.8 years. This outcome is observed either because immigrants stop accumulating education after migrating to the U.S. as Vernez and Abrahamse (1996) suggest is the case for Mexican immigrants that arrive as teenagers, or possibly because Mexican Americans continue to accumulate education at a faster rate than immigrants throughout their lives.

In sum, when the age at arrival is less than six, all immigrant groups exhibit a positive relationship between education and age at arrival. Shortly after the start of the first grade, however, each year of delayed entry for Mexicans, Latin Americans, Europeans, and Pacific Islanders and others lowers the levels of total education. Given the relationships described in Figure 1, Mexican immigrants are at greatest risk.

The Effect of Age at Arrival on Earnings

The previous section showed that age at arrival is an important factor in the education of immigrants. Studies by Bratsberg and Terrell (1994) and Friedberg (1996) provide evidence that the returns to education differ by place of education.[13] Differences between domestic and foreign schooling imply potential earnings differential among immigrants with *equal levels* of education. To show this, let the earnings of immigrants in the U.S. (y_{us}) be determined by the following equation:

$$y_{us} = m_{us} - C_o + r^f_{us} S_o + r_{us} S_{us} \qquad 2a$$

[11] Because the specification restricted the age at arrival to be less than 11 (and hence less observations), age at arrival is included as a third-order polynomial.

[12] Recall that the sample criteria requires immigrants to have at least six years of U.S. experience.

[13] Reimers (1984) finds no difference between U.S. and foreign schooling, while Schoeni (1996) finds that immigrants with no U.S. schooling have lower returns to education than immigrants with U.S.

where m_{us} is a common determinant of earnings in the U.S., C_o is the monetary and psychic costs of migration, S_o is the total years of schooling attained abroad, r_{us}^f is the returns to foreign schooling in the U.S., S_{us} is the additional education attained in the U.S. and r_{us} is the returns to U.S. schooling.

In a non-discriminating, perfectly competitive labor market, r_{us}^f differs from r_{us} because foreign and U.S. education are not perfect substitutes. In general, however, most studies derive one rate of return for education. If the returns to total years of education, $S_T = S_o + S_{us}$, is desired, equation (2a) may be re-written as:

$$y_{us} = m_{us} - C_o + \hat{r} S_T$$

$$\hat{r} = [(\frac{S_o}{S_T}) r_{us}^f + (\frac{S_{us}}{S_T}) r_{us}]. \qquad 2b$$

Thus, (2a) and (2b) state that earnings in the U.S. may differ across immigrants with equal levels of education, S_T, if the returns to foreign education are different than the returns to U.S. schooling. The U.S. labor market may place higher value domestic education because it is of higher quality than foreign education or because domestic schools do a better job of training students for domestic (U.S.) jobs.

With acclimation costs and other disruptions in the education process brought on by delayed entry, the educational attainment of immigrants in the U.S. is negatively related to age at arrival (*AA*), i.e., $(\partial S_{us} / \partial AA) < 0$. Conversely, since there is no acclimation or disruptions in the home country, each year of delayed entry increases the potential amount of country-of-origin education, i.e., $(\partial S_o / \partial AA) \geq 0$.[14] In all, the total amount of education is negatively related to age at arrival of immigrants, $(\partial S_T / \partial AA) < 0$.

Therefore, from equation (2b), age at arrival affects income in two ways:[15]

$$\frac{\partial y_{us}}{\partial AA} = \frac{\partial \hat{r}}{\partial AA} S_T + \frac{\partial S_T}{\partial AA} \hat{r} \qquad 3$$

The first term in the right-hand side of (3) shows that age at arrival affects wages by decreasing the percentage of American schooling, therefore reducing the returns to total education (r), holding total education constant. For example, if delayed entry causes immigrants to substitute one less year of American schooling for one additional year of foreign schooling, the earnings of immigrants decrease by $(r_{us}^f - r_{us})/S_T$ if the returns to American schooling are greater than the returns to foreign schooling. The second term is the loss of income attributable to the lost total amount of education that results from arriving at an older age. The empirical findings of Friedberg (1993) and others confirm the negative relationship between earnings and age at arrival.

Table 3 shows that a non-trivial percentage of immigrants attained mixed levels of U.S. and foreign education.[16] The education background variables describe the various combinations of elementary, secondary, and college experience of immigrants, with *"F"* denoting foreign, *"A"* American, and *"S"* both foreign and American education. FS_g0, for example, represents an immigrant who attended elementary school abroad, spent time in foreign and American secondary schools and graduated from a U.S. high school. Similarly, AA_gA_g denotes a college graduate with all primary, secondary, and college education acquired in the U.S. While most categories average three to seven percent of immigrants, nearly 15 percent of all immigrants only have a foreign elementary-level education (*F00*). However, this fact is explained by the large number of Mexican immigrants (34%) with this level of education.

The empirical data therefore reveal that within any given education level, the amount of U.S.-specific education varies. The next section addresses whether or not the U.S. labor market values American schooling more than foreign schooling.

[14] In countries where educational attainment stops before age of departure, the partial change effect on foreign schooling is zero.

[15] English language ability and acculturation, which affect earnings, are also negatively correlated with age of arrival. However, schools probably play a major role in the acquisition of English skills as well as in the acculturation process. Therefore, years of U.S. schooling will also proxy for such affects.

[16] "All U.S. elementary" is assigned to those who arrived at or before the age of 7; "Some U.S. elementary" to those who arrived between the ages of 8 and 13; "Foreign elementary" to those arriving after the age of 13. "All U.S. secondary" is assigned to immigrants who arrived at or before the age of 15; "Some U.S. high school" to those arriving after the age of 15. Measurement error in the education variable, however, is an inevitable result of the arrival cohort intervals.

Table 3
Distribution of Domestic and Foreign Education of Immigrants[a]

Education	All	Mexico	Latin America	Africa, Mid East	Asia	Europe	Pac. Isl., Other
000	0.029	0.071	0.016	0.005	0.009	0.007	0.023
F00	0.146	0.344	0.077	0.022	0.018	0.054	0.080
S00	0.030	0.068	0.013	0.006	0.003	0.015	0.026
A00	0.009	0.018	0.003	0.001	0.001	0.006	0.010
AA_d0	0.019	0.021	0.017	0.010	0.004	0.021	0.031
SA_d0	0.030	0.042	0.030	0.010	0.011	0.027	0.029
FA_d0	0.018	0.028	0.017	0.005	0.009	0.014	0.015
FS_d0	0.044	0.074	0.054	0.019	0.027	0.023	0.035
AA_g0	0.071	0.046	0.061	0.036	0.028	0.103	0.130
SA_g0	0.073	0.055	0.086	0.047	0.047	0.090	0.087
FA_g0	0.033	0.029	0.040	0.021	0.028	0.037	0.031
FS_g0	0.083	0.077	0.122	0.073	0.102	0.068	0.084
AA_gA_d	0.073	0.032	0.068	0.045	0.056	0.117	0.096
SA_gA_d	0.066	0.031	0.090	0.051	0.076	0.084	0.066
FA_gA_d	0.027	0.013	0.042	0.040	0.044	0.028	0.023
FS_gA_d	0.055	0.026	0.088	0.118	0.111	0.047	0.051
AA_gA_g	0.061	0.010	0.047	0.055	0.078	0.108	0.068
SA_gA_g	0.054	0.007	0.053	0.076	0.103	0.081	0.049
FA_gA_g	0.024	0.003	0.026	0.072	0.065	0.027	0.017
FS_gA_g	0.054	0.005	0.050	0.287	0.179	0.044	0.049

Source: 1980 and 1990 5% Public Use Files, U.S. Census.

[a] The three-letter combinations describe the education background of immigrants. The first letter indicates the source of primary education (grades 1-8), with *A* indicating all American, *F* all foreign, and *S* some foreign and American. The second letter indicates high school education. The subscript *g* denotes a completed grade level, while *d* stands for uncompleted. The last letter indicates college attendance, and the subscripts differentiates graduates (*g*) from non-graduates (*d*). College graduates includes those with 16 or more years of education, and college dropouts includes those with 13 to 15 years of education. *0* denotes no attendance.

The Effect of American Schooling on Earnings

As a whole, the number of completed school years is inversely related to age at arrival. Although the human capital model of earnings shows that more education translates into higher wages, it also shows immigrants educated in the U.S. will also earn higher wages if the quality of schools is greater in the U.S., or if the education systems of foreign countries are not perfectly structured to meet the demands of the U.S. labor market. Such issues limit the transferability of foreign schooling.

As suggested by equations (2a) and (2b), variation in U.S.-specific education potentially affects the earnings of immigrants. To analyze this possibility, I relax the assumption of equal returns to education for all immigrants by including the education variables of Table 3 in a standard human capital regression. The value of an extra year of American schooling can be estimated by the following:

$$\ln w_j = ED_i\delta_i + ED_n\delta_n + C_i\gamma + YUS_i\psi$$

$$+ X_i\phi_i + X_n\phi_n + AGE_j\beta + \pi CEN90_j + \varepsilon_j, \qquad (4)$$

where $ln\ w_j$ is the natural log of hourly wages of person j (i = immigrant, n = native), ED_i is a vector of education variables representing all combinations of country-specific schooling that immigrants may attain. Table 3 lists all of these combinations, but since all immigrants may attend college in the U.S., the locational origin of education varies only for elementary and secondary school. Thus, an immigrant with only a 1-8 grade education is coded as having either an all foreign (*F00*), all U.S. (*A00*), or mixed (*S00*) education level. Those attending high school in the U.S. either have all U.S. education (*AA0*), or a combination of foreign and U.S. education (*SA0, FA0, FS0*). Further distinction among those completing high school and those dropping out of high school is made by subscripting the second letter with a *"g"* for graduates or a *"d"* for dropouts. The possible combinations for those with a college education are *AAA, SAA, FAA,* and *FSA*. College graduates are distinguished from non-graduates by subscripting the third letter with a *"g"* for graduates and *"d"* for dropouts. In all, there are 20 possible education combinations in the vector ED_i, and the omitted category is FS_gA_d – college dropouts with the least amount of U.S. schooling. Similarly, ED_n is a vector of dummy variables for the education attainment for natives, where it equals 1 for grades 1-8, grades 9-11, high school diploma, or college degree (the omitted level is some college). C_i is a vector indicating year of arrival, YUS_i is a vector indicating time in the U.S., X_j is a vector of worker characteristics (including marital status, English ability, division of residence and metropolitan), AGE_j is a vector of third-order age polynomials, and *CEN90* is a 1990 period effect. In order to identify the cohort, assimilation, and age effects, the period effect (p) is the same for natives and immigrants.

Since the focus of this section is the returns to the various education variables, Table 4 lists only the returns to education for immigrants from the regressions described by equation (4). The coefficients in Table 4 measure the wages of individuals relative to college dropouts with the least amount of U.S. education, i.e., FS_gA_d. The first column of Table 4, labeled *"All,"* includes the full sample of natives and immigrants in the regression, and also includes place of origin variables in the regression. Examining the point estimates for the different education levels shows that the source of previous education is significantly important for those with at least a high school diploma. For example, high school graduates with all U.S. schooling earn six percent less than college dropouts with only several years of U.S. high school experience. On the other hand, high school graduates with only a minimal amount of U.S. education (FS_g0) earn 13 percent less, while those with all foreign elementary experience (FA_g0) and those with some foreign elementary schooling (SA_g0) earn 11 and eight percent less, respectively. In other words, if American schools provide higher quality education, then the wage premium for this added quality is in the order of three to seven percent, depending on the extent of U.S. education.

The overall trend is similar for high school graduates of all ethnicities, but the wage differentials are greatest among Mexican, Asian, and other immigrants.

Table 4

Ln Wage Regressions: Returns to Domestic and Foreign Education[a]

	All		Mexico		Latin America		Africa, M.E.		Asia		Europe		Pac. Isl., Other	
	Est.	(S.E)	Est.	(S.E)	Est.	(S.E)	Est.	(S.E)	Est.	(S.E)	Est.	(S.E)	Est.	(S.E)
000	-0.298	(.017)	-0.249	(.030)	-0.223	(.052)	-0.370	(.191)	-0.111	(.076)	-0.248	(.049)	-0.434	(.082)
A00	-0.277	(.026)	-0.228	(.041)	-0.319	(.109)	-0.227	(.347)	-0.737	(.261)	-0.218	(.052)	-0.379	(.116)
S00	-0.276	(.017)	-0.238	(.030)	-0.365	(.057)	-0.381	(.170)	0.003	(.132)	-0.216	(.035)	-0.282	(.080)
F00	-0.265	(.012)	-0.230	(.026)	-0.238	(.031)	-0.243	(.097)	-0.240	(.058)	-0.222	(.024)	-0.271	(.059)
AA_d0	-0.193	(.019)	-0.138	(.040)	-0.279	(.055)	-0.199	(.144)	-0.280	(.112)	-0.197	(.031)	-0.167	(.077)
SA_d0	-0.172	(.016)	-0.145	(.033)	-0.228	(.041)	-0.110	(.136)	-0.041	(.071)	-0.158	(.028)	-0.155	(.076)
FA_d0	-0.198	(.019)	-0.139	(.035)	-0.322	(.050)	-0.238	(.183)	-0.127	(.079)	-0.164	(.035)	-0.249	(.096)
FS_d0	-0.192	(.015)	-0.148	(.029)	-0.190	(.033)	-0.084	(.101)	-0.223	(.048)	-0.188	(.030)	-0.220	(.072)
AA_g0	-0.063	(.013)	-0.017	(.034)	-0.088	(.039)	-0.163	(.084)	-0.044	(.052)	-0.093	(.021)	-0.016	(.057)
SA_g0	-0.077	(.013)	-0.061	(.031)	-0.083	(.031)	-0.169	(.073)	-0.030	(.041)	-0.102	(.021)	-0.019	(.059)
FA_g0	-0.105	(.016)	-0.084	(.035)	-0.112	(.036)	-0.222	(.098)	-0.151	(.047)	-0.084	(.026)	-0.158	(.075)
FS_g0	-0.133	(.012)	-0.118	(.029)	-0.129	(.026)	-0.132	(.061)	-0.148	(.031)	-0.112	(.022)	-0.153	(.058)
AA_gA_d	0.005	(.013)	0.090	(.036)	0.046	(.038)	-0.101	(.078)	0.059	(.044)	-0.047	(.021)	-0.034	(.060)
SA_gA_d	0.021	(.013)	0.064	(.035)	0.071	(.030)	-0.016	(.071)	0.008	(.035)	-0.023	(.022)	0.001	(.062)
FA_gA_d	0.034	(.017)	0.056	(.044)	0.064	(.036)	-0.123	(.076)	0.059	(.040)	0.018	(.028)	-0.056	(.082)
AA_gA_g	0.253	(.014)	0.263	(.049)	0.327	(.041)	0.208	(.073)	0.340	(.040)	0.196	(.021)	0.234	(.064)
SA_gA_g	0.286	(.014)	0.222	(.054)	0.311	(.035)	0.281	(.063)	0.371	(.033)	0.221	(.022)	0.347	(.067)
FA_gA_g	0.303	(.017)	0.202	(.078)	0.309	(.042)	0.271	(.063)	0.348	(.036)	0.256	(.028)	0.201	(.092)
FS_gA_g	0.281	(.014)	-0.004	(.065)	0.256	(.033)	0.274	(.045)	0.348	(.027)	0.203	(.025)	0.263	(.065)
Adj-R^2	0.295		0.224		0.288		0.239		0.332		0.299		0.232	
N	643,184		30,063		10,657		43,629		8,162		441,185		109,488	

[a] *Source:* 1980 and 1990 5% Public Use Files, U.S. Census.

The regressions also include year of arrival and years in the U.S. dummies, census region dummies, metropolitan area dummy, 1990 dummy, English ability, married dummy, widowed or divorced dummy, a third-order polynomial for age, and a constant. The omitted education category is FS_gA_d. See Table 3 for variable definitions.

The wage differentials among Mexicans and Asians with mostly foreign schooling and those with all U.S. schooling is about 10 percent, and about 14 percent for other immigrants. The estimated returns to education indicate that the quality of education is an important factor explaining wage differentials between Mexican immigrants and Mexican-Americans. On the other hand, differentials among Latin Americans and Europeans are in the order of two to four percent. For African and Middle Eastern immigrants, there is a negative relationship between U.S. schooling and wages, as those with all or mostly all U.S. schooling earn between three to nine percent less than those with the least amount of U.S. schooling.

Table 4 reveals that there are other cases in which immigrants with *less* U.S. education earn *more* than other immigrants with the same level of total education. Consider, for example, high school dropouts. Latin Americans, Asians, and Africans and Middle Easterners in the FS_d0 category earn nine, six, and 12 percent more, respectively, relative to immigrants in the AA_d0 category (28, 28, and 20 percent, respectively). While only these groups exhibit a positive relationship between wages and foreign schooling, Mexicans and Europeans show no statistical difference within this level of education. As these two groups constitute a large share of the immigrant population, the "typical" high school immigrant dropout earns about 19 percent less than an immigrant with some college education. Only among other immigrants are there increasing returns to American schooling for high school dropouts.

Lastly, there is no clear relationship between American schooling and the earnings of immigrants with only one to eight years of education. For Mexicans and Europeans, the source of these years of schooling does not matter, while for Latin Americans, Africans, and Asians more American schooling is actually associated with lower wages. These findings are in contrast to Schoeni (1996) who also uses Census data, but finds that immigrants with only foreign education have a lower return to schooling than those educated in the U.S. On the other hand, Reimers (1984) uses data from the Survey of Income and Education and finds that foreign education is not valued differently from U.S. schooling. However, the findings in Table 4 suggest that differences in the returns to domestic and foreign education depend on the grade level completed.

To demonstrate the importance of distinguishing between foreign and domestic education, Table 5 shows the estimated coefficients from a regression which substitutes the education variables of Table 4 with total education variables which do not distinguish between American and foreign schooling. Although choice of omitted category is an important consideration, the estimated returns to education in Table 5 provide a benchmark with which to measure the coefficients in Table 4. A striking difference between Tables 4 and 5 is the estimated return to a college degree for Mexican immigrants. The estimated coefficient in Table 5 implies a return of 14 percent to a college degree relative to those with several years of college education. However, controlling for the source of education reveals much greater returns to a college degree: Mexican immigrants with all U.S. schooling have 26 percent higher log wages than college dropouts with only several years of U.S. high school experience. This log wage differential translates into college graduates earning 30 percent more per hour than the base group.[17] Similar results are found among Latin American immigrants. European, African and Middle Eastern, and other immigrants with all U.S. education (AA_gA_g) earn less than indicated by the estimated returns to college graduates in Table 5.

In sum, the greatest wage penalty for less U.S. schooling is found among high school graduates. Among college graduates, there is evidence of greater returns to college education for only certain immigrant groups.

Policy Implications

The findings of the previous section raise an interesting policy question. Should the families that are in

[17] The implied percentage wage differential is e^x-1. where x is the difference in log wages.

Table 5
Ln Wage Regressions: Returns to Total Education[a]

	All		Mexico		Lat Amer		Africa/M.E.		Asia		Euro		Pacif Isl/Other	
Grade Level	Est.	(S.E.)	**Est.**	**(S.E.)**	Est.	(S.E.)	**Est.**	**(S.E.)**	Est.	(S.E.)	**Est.**	**(S.E.)**	Est.	(S.E.)
0	-0.306	(.015)	**-0.291**	**(.021)**	-0.262	(.050)	**-0.335**	**(.189)**	-0.121	(.074)	**-0.225**	**(.046)**	-0.406	(.072)
1-8	-0.275	(.008)	**-0.274**	**(.015)**	-0.295	(.025)	**-0.233**	**(.082)**	-0.236	(.051)	**-0.197**	**(.016)**	-0.255	(.039)
9-11	-0.197	(.009)	**-0.191**	**(.016)**	-0.271	(.021)	**-0.092**	**(.068)**	-0.187	(.034)	**-0.153**	**(.015)**	-0.169	(.038)
12	-0.105	(.007)	**-0.126**	**(.016)**	-0.147	(.016)	**-0.117**	**(.040)**	-0.126	(.020)	**-0.074**	**(.010)**	-0.044	(.028)
College	0.264	(.007)	**0.138**	**(.028)**	0.256	(.018)	**0.308**	**(.032)**	0.328	(.017)	**0.236**	**(.010)**	0.288	(.032)

Source: 1980 and 1990 5% Public Use Files, U.S. Census.

[a] The regressions also include year of arrival and years in the U.S. dummies, census region dummies, metropolitan area dummy, 1990 dummy, English ability, married dummy, widowed or divorced dummy, a third-order polynomial for age, and a constant.
The omitted education category is Some College.

the U.S. have been encouraged to immigrate when their children were younger? This would increase the amount of American schooling and therefore increase the earnings of some immigrant groups. However, from the point of view of natives, admitting immigrant children at an earlier age implies higher taxes to pay for their education. The public debate about the cost of educating immigrant children raises the question of whether or not the U.S. should incur the cost of educating immigrants.[18] That is, rather than educating immigrants in the U.S., the government may be better off admitting only those who have completed their primary and secondary schooling overseas.

Although there are non-monetary benefits to educating immigrant children (such as instilling a sense of citizenship), it is possible to address the fiscal concerns by finding whether the additional income earned by immigrants is sufficient to fully offset the cost of their education. The experiment below examines the effect of admitting the *existing* child immigrants at an earlier age so that they can attain more U.S. education. In other words, the one-for-one exchange of foreign and domestic education does not affect the consumption of public goods by current immigrants. Any additional income that is earned (and taxed), therefore would go to pay for the additional years of education. As natives determine immigrant policies, there would be no change in policy unless the benefits to natives outweighed the cost to them. The goal is to discover if immigration policy should encourage families to migrate when their children are relatively young.[19]

Additional Taxable Immigrant Income

The analysis of the gain from providing additional years of U.S. schooling to immigrants assumes that the only benefit is the increased immigrant income. Assuming that immigrants work 2,000 hours per year for 40 years, the discounted present values of lifetime earnings are given in the top panel of Table 6 (using a five percent discount rate).[20] The dollar figures in Table 6 translate the differences in the returns to education in Table 4 into lifetime earnings differentials.

While the top panel shows the private gain to immigrants, the bottom panel of Table 6 provides the present discounted value of future tax payments by immigrants, assuming a total tax rate of 30 percent given by Borjas (1994). The first three rows in each education level represent the marginal increase in income and taxes that results from "some" additional years of primary U.S. education (SA_g0 *to* AA_g0, for example) and "some" additional years of secondary U.S. education (FS_gA_g to FA_gA_g, for example). The last row in each education level is the increase in income and taxes resulting from all U.S. primary and secondary education (i.e., FS_g0 to AA_g0).

The Cost of Education

While Table 6 shows that some ethnic groups benefit from American schooling, it is not clear that American taxpayers benefit from providing education to immigrants. Parrish, Matsumoto, and Fowler (1995), provide detailed analysis of primary and secondary school expenditures for the U.S. (in 1989 dollars) which makes it possible to construct measures of the cost of educating immigrants. Controlling for cost-of-living and need differences, the *total expenditure per student* in the U.S. in 1989 is $4,151 for primary and $5,201 for secondary school.[21]

Using these figures, I create a measure of the monetary cost of educating immigrants in Table 7.[22] Table

[18] See, for example, *The Unfair Burden: Immigration's Impact on Florida* (1994).

[19] Even if child immigrants are a "net burden," providing an education to these children may be a necessary cost in order to have the adult immigrants choose the U.S. over another destination country, such as Canada or Australia.

[20] The earnings differential due to the educational difference (A - B) is $\Delta = (\hat{\beta}_A - \hat{\beta}_B)w$, where w is the average wage and $\hat{\beta}_A$, and $\hat{\beta}_B$ are the returns to the two education levels. To account for the growth in earnings over a lifetime, Δ is multiplied by the component of earnings attributable to age and experience in the U.S.[18] See, for example, *The Unfair Burden: Immigration's Impact on Florida* (1994).

[21] Estimates are also provided for other community characteristics, such as geographic region, but for the sake of exposition, only the U.S. estimate is used. Because most recent immigrants concentrate in the West and because the expenditures per pupil are lower in this geographic region, these costs overestimate the cost in these regions.

[22] It is not clear whether or not immigrants pay for all, part, or none of a college education. Therefore, for the sake of exposition, the cost analysis in Table 7 is limited to primary and secondary education.

Table 6

Present Discounted Values of Immigrant Income and Taxes from Additional U.S. Education[a]

Additional Income

		All	Mexico	Latin America	African, M.E.	Asian	Europe	Pac. Isl., Other
SA_g0	to AA_g0	$29,357	$62,092	-$7,866	$10,245	-$35,415	$15,932	$3,735
FA_g0	to SA_g0	$57,846	$32,657	$45,354	$106,030	$312,382	-$31,213	$169,595
FS_g0	to FA_g0	$57,376	$48,907	$27,321	-$178,702	-$5,688	$47,222	-$6,625
FS_g0	to AA_g0	$144,580	$143,657	$64,809	-$62,426	$271,279	$31,941	$166,705
SA_gA_d	to AA_gA_d	-$32,948	$37,864	-$38,741	-$168,757	$132,185	-$41,032	-$42,976
FA_gA_d	to SA_gA_d	-$26,615	$10,485	$10,080	$212,383	-$131,572	-$69,428	$69,142
FS_gA_d	to FA_gA_d	$69,672	$80,248	$99,856	-$245,302	$152,066	$31,074	-$68,249
FS_gA_d	to AA_gA_d	$10,109	$128,598	$71,194	-$201,675	$152,679	-$79,386	-$42,083
SA_gA_g	to AA_gA_g	-$68,761	$59,087	$24,125	-$147,061	-$78,940	-$42,502	-$137,559
FA_gA_g	to SA_gA_g	-$34,495	$28,931	$3,371	$21,412	$58,362	-$59,731	$178,302
FS_gA_g	to FA_gA_g	$44,187	$292,252	$82,041	-$7,484	-$80	$90,408	-$75,802
FS_gA_g	to AA_gA_g	-$59,069	$380,270	$109,537	-$133,134	-$20,658	-$11,826	-$35,059

Additional Taxes

		All	Mexico	Latin America	African, M.E.	Asian	Europe	Pac. Isl., Other
SA_g0	to AA_g0	$8,807	$18,628	-$2,360	$3,074	-$10,625	$4,780	$1,120
FA_g0	to SA_g0	$17,354	$9,797	$13,606	$31,809	$93,715	-$9,364	$50,878
FS_g0	to FA_g0	$17,213	$14,672	$8,196	-$53,611	-$1,706	$14,167	-$1,987
FS_g0	to AA_g0	$43,374	$43,097	$19,443	-$18,728	$81,384	$9,582	$50,011
SA_gA_d	to AA_gA_d	-$9,884	$11,359	-$11,622	-$50,627	$39,655	-$12,310	-$12,893
FA_gA_d	to SA_gA_d	-$7,985	$3,146	$3,024	$63,715	-$39,472	-$20,828	$20,743
FS_gA_d	to FA_gA_d	$20,902	$24,075	$29,957	-$73,590	$45,620	$9,322	-$20,475
FS_gA_d	to AA_gA_d	$3,033	$38,579	$21,358	-$60,503	$45,804	-$23,816	-$12,625
SA_gA_g	to AA_gA_g	-$20,628	$17,726	$7,237	-$44,118	-$23,682	-$12,751	-$41,268
FA_gA_g	to SA_gA_g	-$10,348	$8,679	$1,011	$6,424	$17,509	-$17,919	$53,491
FS_gA_g	to FA_gA_g	$13,256	$87,676	$24,612	-$2,245	-$24	$27,122	-$22,741
FS_gA_g	to AA_gA_g	-$17,721	$114,081	$32,861	-$39,940	-$6,197	-$3,548	-$10,518

[a] *Note*: The discount and tax rate is 5% and 30%, respectively. These calculations use the estimates from Table 4 and average wage of each ethnic group. The average wage (in 1989 dollars) of All ethnic groups is $15.09, $11.40 for Mexicans, $13.05 for Latin Americans, $16.00 for Europeans, $12.78 for Africans and Middle Easterners, $15.48 for Asians, and $13.53 for Pacific Islanders and Other. All immigrants are assumed to work 2,000 hours per year for 40 years. See Table 3 for variable definitions. The age-earnings profile is predicted by adding the effect of years in the U.S. and age at every point in the working life of immigrants.

Table 7
Future Discounted Value of Expenditure Per Pupil

	Total Cost	Native Share[a]	Immigrant Share[a]
Primary			
2 More Years	$8,510	$5,957	$2,553
4 More Years	$17,891	$12,524	$5,367
All 8 years	$39,638	$27,747	$11,892
Secondary			
2 More Years	$10,662	$7,463	$3,199
4 More Years	$22,417	$15,692	$6,725
8 yrs Prim. + 2 yrs. HS	$50,300	$35,210	$15,090
8 yrs Prim. + 4 yrs. HS	$62,055	$43,439	$18,617

[a] *Note*: Immigrants are assumed to have a 30% tax rate, and hence pay 30% of the total cost.

7 gives the future discounted value of dollars spent on education, assuming a discount rate of five percent. For example, the total cost of giving an immigrant two more years of primary schooling is $8,510. Using the total tax rate of 30 percent for immigrants given by Borjas (1994), the "Immigrants" column represents the share of total costs paid by immigrants, while the "Natives" column is the amount paid by natives. The "fair" share of immigrant taxes for providing two more years of primary education is therefore $2,553. However, any tax payments lower than the full cost of additional education makes natives worse off and so an immigration policy would not encourage family reunification when the children of immigrants are still young.

Net Burden or Benefit?

Having established the benefits and the costs of additional years of American schooling, it is now possible to compare the benefits and costs. The tax contribution of the average immigrant with "several" more years of U.S. elementary education averages $13,100 for high school graduates, $8,900 for college dropouts, and $15,500 for college graduates. As the cost of several more years of U.S. primary education ranges from $8,500 to as much as $17,900 for four years, only high school graduates come close to paying all of the educational cost. A higher tax rate of about 40 percent on the additional income would eliminate the difference among high school graduates.

However, this conclusion does not hold for Mexican, Asian, and Pacific Island and other immigrants. These immigrants with at least a high school diploma earn more if they attain several more years of U.S. elementary schooling. The average discounted value of future tax payments from "several" more years of U.S. elementary education across all three levels of education (high school graduates, college graduates and dropouts) in Table 6 is $11,500 for Mexican immigrants, $12,900 for Asian, and $12,000 for other immigrants. In other words, higher earnings of these immigrants are sufficiently high enough to pay for up to nearly three additional years of *primary* education in the U.S.

"Several" more years of U.S. *high school* education generate sufficient tax revenue to offset most of the cost of providing this schooling. The average of the categories which indicate the gains from additional American high school education ($FS_g x$ to $FA_g x$) is $17,100, while the cost of providing two to four years of high school education ranges from $10,600 to $22,400. Mexican immigrants contribute an average of $42,000, while Latin Americans, Asians, and Europeans contribute an average of $21,000, $14,600, and

$16,900 respectively. Only immigrants from Africa and the Middle East, and those from the Pacific Islands and other regions are not able to earn additional income to compensate American taxpayers for more years of high school.

The last change in education that is considered is giving an immigrant with the least amount of U.S. education ($FS_g x$) a full American education ($AA_g x$). In general, the cost of providing 12 years of primary and secondary education is greater than the increased tax revenue. While the cost is $62,000, the tax revenue only averages $9,600 among "All" immigrants. With the exception of Mexican immigrants, this conclusion holds among other ethnic groups. The average contribution of Mexicans is $65,300, while the next highest average contribution is $40,300 by Asians.

Immigration policies would improve the welfare of both natives and immigrants by expediting the admission of Mexican, Asian, and Pacific Islander and other families with children nearing the end of their primary schooling. Mexican, Latin American and European families should also be encouraged to migrate if their children are about to start high school. As a general policy, therefore, Mexican families with children of any age that are enrolled in schools in Mexico should be given preference for admission.

Conclusion

Age at arrival is an important determinant of the educational achievement among most immigrant groups. For Mexicans, Europeans, and Pacific Islander and other immigrants, the adverse effect of age at arrival is most pronounced. For Mexicans, each year of delayed entry results in an educational loss of about 1/3 to 1/4 of a year. This loss is greater than the cross-section estimate of Allensworth (1997) of 0.16 years less education per year. The lower amount of U.S. education that results from delayed entry reduces the earnings capacity, and therefore the tax payments, of several immigrant groups.

The economic cost of delayed entry is the value of foregone productivity, which is equal to the wages of immigrants. Estimating the returns to education across immigrant groups reveals that additional U.S. schooling does not always lead to greater wages. The quality of U.S. schooling is equal to that of the top five countries in the world (Bratsberg and Terrell, 1994). This implies that some immigrants are better off attaining more of their education abroad. Only among high school graduates is it cost effective to provide several more years of U.S. schooling. In particular, as Mexicans now constitute the largest percentage of immigrants from any one country, it is important to note that the results of this study indicate that the increased taxes paid by Mexicans outweigh the cost of their education.

Although providing several more years of education increases the earnings of certain immigrants with at least a high school diploma, it is not always the case that the additional tax revenue is sufficient to pay for cost of the education. In particular, all African and Middle Eastern immigrants, primary school-level Latin American and European immigrants, and high school-level Pacific Islander and other immigrants would be better served by acquiring schooling in their home countries. However, it must be pointed out that higher income also reduces the number of immigrants eligible for welfare and also increases the tax bracket of these immigrants. As these features are not incorporated into the analysis, I underestimate the benefits of exchanging American for foreign schooling. Nevertheless, the cost-benefit calculations indicate that changing immigration laws to admit children immigrants at a younger age imposes, at worst, a small burden on American taxpayers.

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